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CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD
UNIVERSITY, NEW SERIES, NO. XX.

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Presented March 13, 1901. Received March 16, 1901.

I. — SYNOPSIS OF THE GENUS MELAMPODIUM.

IN the following key to *Melampodium* the genus is limited as by Bentham and Hooker in their *Genera Plantarum* and by Hoffmann in Engler & Prantl's *Natürlichen Pflanzenfamilien*. It will, therefore, be unnecessary here to reproduce the generic description or give generic synonymy. The key is based chiefly upon the material which has accumulated in the Gray Herbarium, including the recently acquired Klatt collection and some borrowed material from the U. S. National Museum. The writer has also in connection with this work been kindly permitted by Mr. Casimir de Candolle to examine and trace the types in the *Prodromus Herbarium*. Much difficulty has been experienced in giving the species a natural sequence, and after many efforts the hope of securing such an arrangement has been abandoned. The employment of pubescence in grouping the species of this genus is new and appears to yield more satisfactory results than an implicit reliance upon the fructiferous bracts. The latter, as is well known, often surpass the achenes, forming above them a cup or hood. This hood is often pointed dorsally at the summit and the point may be recurved or spirally coiled. Unfortunately, however, these features, the hood and its appendage, show too great variability in certain nearly related forms, such as *M. sericeum* and its varieties, to yield diagnostic characters of the first rank. However, the presence or absence of a hood can usually be determined readily, and the two sections *Eumelampodium* and *Zarabellia* may conveniently be retained.

Bentham and Hooker, l. c., estimated the species at eighteen, and Hoffmann, l. c., accords twenty-five species to the genus. It will be seen, however, that this number can, with our present knowledge, be somewhat increased. The genus reaches its greatest development in Mexico, where, if we include Lower California and Central America, no less than thirty-one species occur. Of these species three reach the southern United States (one merely as an introduction), two are found

in the West Indies, and two or three extend to South America. There are also two species known exclusively from South America. Early in the nineteenth century a species of *Melampodium* (*M. diffusum*) was discovered on the island of Luzon in the Philippines. As the genus is otherwise American, the occurrence of this species in a region so remote has always been problematic, and it has been a matter of no small interest to find the Philippine plant closely matched by specimens recently collected by Dr. Edward Palmer, about Acapulco, Mexico. There can therefore be scarcely a doubt that the genus is in reality of New World origin, and that a single Mexican species was accidentally introduced into the Philippines, where it attracted scientific attention before it was recognized in America. This seems the more likely from the circumstance that Mexico and the Philippines were under the same national control, and early connected by a certain amount of oceanic traffic. This being the case, the transference of seed from Acapulco, the most important Pacific port of Mexico, to the neighborhood of Manila, presents no inherent improbability. The writer is under obligation to M. Robert Buser of the De Candolle Herbarium for critical comparison, notes, and sketches relative to this and related species.

In this paper the term *fruit* is applied to the ray-achene and the closely enveloping bract.

§ 1. *EUMELAMPODIUM*, DC. Inner (fructiferous) bracts of the involucre exceeding the inclosed achene and developed at the summit into a cup or hood (this obsolete in some forms of *M. sericeum*). — Prodr. v. 518 (1836).

* Lower surface of the leaves sparingly pubescent to hirsute, villous, or tomentose, but not sericeous.

+ South American species: hoods scarcely or not at all appendaged.

++ Herbaceous annual: rays conspicuous, 6.5 mm. long, unguiculate.

1. *M. PALUDICOLA*, Taubert in Engl. Jahrb. xxi. 455 (1896). — Swamps on the Parahyba River, Prov. Goyaz, Brazil, *Ule*, no. 2978. Not seen by the writer.

++ ++ Suffrutescent: rays very small, inconspicuous.

2. *M. SUFFRUTICOSUM*, Baker in Mart. Fl. Bras. iv. pt. 3, 162 (1884). On the Esmeralda plains of the upper Orinoco in S. Venezuela. A species omitted from the Index Kewensis. The achenes are crowned by a shallow cup, otherwise the plant would be placed next *M. camphoratum*, to which according to the original description it is presumably related.

+ + Species of Mexico and S. United States.

++ Rays short and inconspicuous: appendage of the hood elongated, recurved or coiled: heads usually (but not always) subsessile or short-peduncled.

3. *M. LONGICORNU*, Gray, Mem. Am. Acad. v. 321 (Pl. Thurb.), 1854, where by misprint *longicorne*. — S. Arizona, near Ft. Huachuca, Lemmon, no. 2777; Sonora, Santa Cruz, Thurber, no. 937 (type); Chihuahua, near the city, Pringle, no. 10; San Luis Potosi, Parry & Palmer, no. 443½.

++ ++ Ligules longer, exceeding the involucre bracts, conspicuous: peduncles mostly long.

= Soft-stemmed, strictly herbaceous and annual.

a. Pubescence short, scanty: leaves oblong to linear, entire: appendage of the hood long: involucre gamophyllous about to the middle.

4. *M. appendiculatum*. Slender, erect, sparingly pubescent annual, 3 to 4 or more dm. high, branched almost from the base: leaves thin, oblong to linear, attenuate at the apex, scarcely narrowed to the sessile subauriculate base: obsoletely serrate to quite entire, the larger ones (near the middle of the stem) 5 cm. long, 1 cm. broad: peduncles 2 to 7 cm. long, erect, slender: involucre saucer-shaped or shallowly cup-shaped, gamophyllous, the limb shallowly 5-lobed; the lobes rounded or barely and very obtusely pointed, their margins scarious: pubescence of the peduncles and involucre short and sparing: rays 8 to 10, oblong, yellow, 6 mm. in length, 2-3-toothed at the apex; fruit tuberculate, the conspicuous appendage a linear coiled awn from an ovate-lanceolate somewhat 2-toothed base: pales scarious. — Southwestern Chihuahua, Dr. Edward Palmer, no. 245 (collection of 1885). Type in herb. Gray. This species has the outer involucre of *M. cupulatum*, Gray, and the fruit of *M. longicornu*, Gray, yet it is clearly distinct from both, differing from the former not only in its long peduncles and well-developed ligules, but in stature and in the size of the leaves, and from the latter in the presence of a hood and appendage (both totally lacking in *M. cupulatum*) and in the subauriculate base of the leaves.

Var. *leiocarpum*. Similar in all points but the fruit smooth, striate, glandular-punctate, not at all tuberculate. — Collected by Dr. Edward Palmer at Alamos, 16-30 September, 1890, no. 726. Type in herb. Gray.

Var. *sonorense*. Involucre deeper, subcampanulate: fruit slightly roughened: otherwise like the type. — Collected by C. V. Hartman at Cochuto, Sonora, 2 October, 1890, no. 71. Type in herb. Gray.

b. Pubescence short and stiff: leaves lanceolate, undulate: fruit hooded, but the appendage shorter or sometimes obsolete.

5. *M. arenicola*. Decumbent or suberect, branching from near the base; stems dark purple, covered with stiff white somewhat reflexed

hairs: leaves lanceolate from a narrowed auriculate base, undulate to sparingly and irregularly scabrous-pubescent upon both surfaces, 3 to 5 cm. long, 8 to 11 mm. broad: peduncles slender, pubescent, 3 to 7 cm. long; heads often nodding, 1.2 cm. in diameter (including narrow yellow entire or bidentate ligules); involucre shallow, saucer-shaped, the 5 divisions united nearly to the middle, broad, scarious and ciliate at the margin: fruit finely striate, punctate and slightly tuberculate, bearing a well-developed hood surmounted by a slender recurved hispidulous appendage not flanked by lateral teeth at the base. — Collected by F. H. Lamb in sandy soil on Isla Piedra, Mazatlan, Sinaloa, 31 December, 1894, no. 361a. Mr. Lamb's no. 380 also from Mazatlan differs in having no tubercles upon the fruit and in the obsolescent appendage, yet it is probably of the same species. Type in herb. Gray.

c. Pubescence copious, soft, long, villous: leaves ovate-lanceolate to ovate: appendage of the hood short: involucre gamophyllous only near the base.

6. *M. LONGIPILUM*, Robinson. Involucre externally villous, its divisions acutish. — Proc. Am. Acad. xxvii. 173 (1892). — San Luis Potosi, *Pringle*, nos. 3639, 4537.

= = Stems tending toward lignescence: roots at least in part perennial: species of northern Mexico and southern United States.

a. Heads rather small, (including the rays) about 1 to 1.2 cm. in diameter: leaves conspicuously sinuate or pinnatifid: rays thin, short.

7. *M. CINEREUM*, DC. l. c. (1836). Hood muticous. — Laredo, Texas, *Berlandier*, who appears to have confused this with the variety *ramosissimum*, so that his numbers cannot be depended upon.

Var. *RAMOSISSIMUM*, Gray. Hood mucronate. — Syn. Fl. i. pt. 2, 239 (1884), in part. *M. ramosissimum*, DC. Prodr. v. 518 (1836). — Near Laredo, *Berlandier*, S. W. Texas and adjacent Coahuila, *Palmer*, nos. 556, 557, 558 (coll. of 1880).

Var. *ARGOPHYLLUM*, Gray. Hood muticous: leaves small, tomentose upon both surfaces, canescent above, snowy white beneath. — Gray in Wats. Proc. Am. Acad. xviii. 104 (1883 without description). — Coahuila and Nuevo Leon, *Palmer*, no. 2068 (coll. of 1880).

8. *M. LEUCANTHUM*, Torr. & Gray, Fl. ii. 271 (1842). — The commonest form of our southwestern States. Kansas, Hamilton County, *Hitchcock*, no. 250; W. Texas, *Lindheimer*, no. 636, *Reverchon*, no. 1380*, *Thurber*, no. 128, *Heller*, no. 1632, *Pope*, *Bigelow*, *Wislizenus*; New Mexico, *Thurber*, no. 1105, *Wootton*, no. 117; Arizona, *Rothrock*, no. 327, *Palmer*, no. 608, *Pringle*, coll. of 1884; Chihuahua, *Pringle*. This plant has of late been generally regarded as a mere form of

M. cinereum, DC. However, it differs conspicuously in its more entire erect or ascending thickish leaves, its much larger heads (nearly or quite twice as broad) and its long thickish, firm, persistent, and veiny rays. It is a much commoner and more widely distributed plant than *M. cinereum*, and may be conveniently regarded as a specific type.

* * Lower surface of the leaves silky-villous, the pubescence more or less flocculent and tending to be deciduous.

+ Ligules shorter than or about equalling the fructiferous bracts: heads sessile or short-peduncled.

9. *M. SERICEUM*, Lag. Hoods tipped by a slender recurved appendage. — "Elench. Hort. Madr. 1805," Gen. et Spec. Nov. 32 (1816); DC. Prodr. v. 518; not HBK. — Mexico, *Mendez*; Oaxaca, *Pringle*, no. 6728; Durango, *Rose*, no. 3476; Jalisco, *Rose*, nos. 2819, 3561; Esperanza, *Dugès*.

Var. *exappendiculatum*. Hood destitute of a mucro or appendage, sometimes itself obsolete. — In mountains near Morales, San Luis Potosi, *Schaffner*, no. 271 in part; base of Iron Mountain, Durango, *Dr. E. Palmer*, no. 926 (coll. of 1896); Guanajuato, *Prof. A. Dugès*, *Pringle*, no. 5309; Federal District, *Pringle*, no. 7978 (form approaching *M. hispidum*, HBK).

+ + Ligules conspicuous, usually much exceeding the fructiferous bracts: peduncles long and slender.

↔ Leaves (at least in part) pinnatifid; segments rather broad.

10. *M. AMERICANUM*, L. Spec. ii. 921 (1753); Rel. Houst. 9, t. 21; DC. Prodr. v. 518. — Vera Cruz, Mexico, *Houston*. With this clearly figured plant from Vera Cruz I have been unable to match any specimens from Southeastern Mexico. However, the following specimens from the western coast probably belong here: Manzanillo, *Xantus*, and Colima, *Palmer*, no. 136 (coll. of 1897), and no. 1172 (coll. of 1891).

↔ + Leaves, at least in part, deeply cleft, segments narrow, linear.

= Outer bracts of the involucre pointless, surrounded by a thin yellow somewhat hyaline border.

11. *M. LINEARILOBUM*, DC. Prodr. v. 518 (1836). *M. sericeum*, Benth. in Oerst. Vidensk. Meddel. 1852, p. 86, not Lag. — A well-marked species represented by the following specimens: Oaxaca, *Nelson*, nos. 2809, 2339 (pathological); Chiapas, *Nelson*, no. 2949; Guerrero, hills near Iguala, *Pringle*, no. 9162; Nicaragua, *Oersted*; Sinaloa, *Rose*, no. 3183.

= = Outer bracts of the involucre not membranous-margined or colored, herbaceous to the acuminate apex.

12. *M. longipes*. *M. sericeum*, var. *longipes*, Gray, Proc. Am. Acad. xii. 423 (1887). — Erect, 4 to 5 dm. high, widely branched: upper and

lower leaves entire, lance-linear, acute at both ends, 4 to 5.5 cm. long, 4 to 5 mm. broad, the middle cauline leaves deeply and pinnately 3-cleft into linear acute segments, finely pubescent above, flocculent-sericeous beneath: peduncles filiform, springing from the forks, 2 to 5 cm. long: heads 1.2 to 1.4 cm. broad (including the rather numerous well-exserted narrow bright yellow ligules): fruit tuberculate, the hood well developed and passing gradually and without intermediate toothings into a long slender spirally coiled appendage. — Jalisco, Mexico, on dry hillsides near Tequila, *Dr. Edward Palmer*, no. 391 (coll. of 1886), *C. G. Pringle*, no. 4598. Type in herb. Gray. This plant although in habit identical with *M. heterophyllum*, Lag., is strictly herbaceous and annual. This fact, together with the hooded and appendaged fruit, seems to warrant its separation. It is certainly distinct from *M. sericeum*, Lag.

++ ++ ++ Leaves undivided.

13. *M. KUNTHIANUM*, DC. Prodr. v. 519 (1836). *M. sericeum*, HBK. Nov. Gen. & Spec. iv. 272, t. 398 (1820), not Lag. — Of this species I have seen only a single and imperfect specimen in the De Candolle Herbarium. The leaves are linear, or nearly so, and entire; the fruit is provided with a well-developed hood but no appendage. This species also exhibits a suspicious resemblance to *M. heterophyllum*, Lag., and it may represent Lagasca's var. β .

14. *M. DIFFUSUM*, Cass. Dict. lix. 238 (1829). *M. manillense*, Less. Linnaea, vi. 155 (1831). After examining authentic material of this species in the Prodromus herbarium I can confidently refer to it Dr. Palmer's nos. 3 and 281 from Acapulco, Mexico (coll. of 1895). The species has been hitherto recorded only from the Island of Luzon. As the genus as a whole is American, and as this species is now found to be also an American plant, its occurrence in the Philippines may very likely be due to introduction. At all events it seems from the distribution of the other species more likely that this plant has been carried from Mexico to the Philippines, than the reverse.

Var. *lanceolatum*. *M. lanceolatum*, DC. Prodr. v. 519 (1836). — Fruit with a short hood but no appendage; otherwise closely like the typical form. — Collected by Nee, but the locality unknown. Nee visited both Acapulco, Mexico, and the Philippine Islands.

§ 2. *ZARABELLIA*, DC. Fructiferous bracts not exceeding the inclosed achenes, nor developed into a cup, hood, or appendage at the summit. — Prodr. v. 519 (1836). *Zarabellia*, Cass. Dict. lix. 240.

* Peduncles long and slender: ligules well exserted, conspicuous.

← Leaves sericeous beneath.

++ Leaves of diverse forms, partly entire, partly cleft : Mexican.

= Peduncles long : rays conspicuously exserted : sterile flowers numerous : pales yellow-tipped.

15. *M. HETEROPHYLLUM*, Lag. Gen. et Spec. Nov. 33 (1816) ; DC. l. c. — Tantoyuca, Huasteca, *Berlandier*, nos. 741, 2161, *Ervendberg*, no. 80 ; between San Luis Potosi and Tampico, *Palmer*, no. 1103 (coll. of 1879).

= = Peduncles short or none : rays 3 to 4, minute : sterile flowers 1 to 3 : pales purple-tipped.

16. *M. Pringlei*. Root perpendicular, long, with fibrous branches, probably annual ; stem copiously branched from the base ; the branches terete, purple, hirsute : leaves chiefly undivided, narrowly elliptic-lanceolate, 2 to 3 cm. long, 3 to 6 mm. broad, acutish, finely subappressed-pubescent above, snowy-sericeous beneath : lower heads short-peduncled from the forks, the upper subsessile, lateral and terminal, all small and few-flowered ; outer bracts of the involucre 5, lance-linear and acute or somewhat spatulate, 3.5 mm. long, so narrow as to disclose the young fruit at an early stage in its development : ray-flowers 3 to 4 ; ligules very small, oval or sub-orbicular, entire or slightly 2-toothed : pales purple tipped ; disk-flowers 1 to 3, mostly reduced to a clavate rudiment : fruit of the ray-flowers obovoid, strongly tuberculate, destitute of hood, cup, or appendage. — Collected by C. G. Pringle, at Las Sedas, Oaxaca, altitude 1,850 m., 15 September, 1894, no. 5722. Type in herb. Gray.

++ ++ Leaves all undivided, linear : South American.

17. *M. ANGUSTIFOLIUM*, DC. l. c. (1836). — Peru, *Haenke*.

+ + Leaves not sericeous beneath.

++ Slightly lignescent perennial : Lower California.

18. *M. SINUATUM*, Brandege, Proc. Calif. Acad. Sci. ser. 2, iii. 144 (1891). — San José del Cabo, *Brandegee*, no. 302.

++ ++ Mexican and S. American species : annuals except *M. montanum*.

= Leaves cordate- or auriculate-clasping at the base.

19. *M. Rosei*. Erect annual, 3 to 4 dm. high ; stem purplish, copiously branched almost from the base, covered with short white retrorse hairs : leaves oblong-lanceolate, attenuate, sinuately toothed, slightly narrowed to auriculate-clasping somewhat connate bases, sparsely pubescent upon both surfaces, scabrous on the margin, scarcely paler beneath, the larger about 7 cm. long, 2.5 cm. broad : peduncles in the forks of the stem, 7 cm. long, filiform, retrorsely pubescent ; outer involucre 5-parted, the divisions broadly ovate or suborbicular, rounded or barely pointed at the apex, pubescent upon the back : ray-flowers 8 to 10, ligules oblong,

golden yellow, 2-toothed at the tip, about 4 mm. long; fructiferous bracts (without hood or appendage) marked with 3 rows of tubercles upon each lateral surface. — Collected by Dr. J. N. Rose between Rosario and Concepcion, Sinaloa, no. 3271. Type in herb. U. S. Nat. Museum.

Var. *subintegrum*. Leaves clasping at the base but their margins unlobed, obsoletely crenate-serrate. — Collected by Dr. J. N. Rose at Rosario, Sinaloa, 7 July, 1897, no. 1568.

20. *M. mimulifolium*. Dichotomously branched herb; stems purplish-streaked, loosely villous and finely pubescent along a longitudinal line: leaves lanceolate, acuminate, entire or obsoletely serrulate, 5 to 7 cm. long, 1.2 to 2 cm. broad, appressed-pubescent upon both surfaces, somewhat narrowed to an auriculate amplexicaul base: peduncles in the forks of the stem, 4 cm. long, filiform, covered with a fine spreading pubescence: outer involucre 5-parted; segments ovate-lanceolate, acute, somewhat accrescent, appressed-villous: ligules about 8, short-oblong, 2-3-toothed: fruit short, broad, somewhat quadrate, without hood or appendage, compressed, thin, depressed upon the lateral faces, finely tuberculate dorsally. — Collected by E. W. Nelson in the vicinity of Totontopec, Oaxaca, altitude 1700 to 2150 m., 15 July, 1894, no. 740. Type in herb. U. S. Nat. Museum. The foliage recalls that of *Mimulus ringens*.

= = Leaves neither cordate nor auriculate-clasping (except obscurely so in *M. gracile*).

a. Divisions of the outer involucre 3, ovate to ovate-lanceolate, acute or acuminate.

21. *M. PANICULATUM*, Gardn. in Hook. Lond. Jour. Bot. vii. 287 (1848). — Eastern and Central Brazil.

22. *M. GRACILE*, Less. Leaves rhombic, unlobed or panduriform, more or less narrowed to an obscurely auriculate or at least obtuse base. — Linnaea, vi. 407 (1831). — Papantla, *Schiede & Deppe*; Tantoyuca, Huasteca, *Ervendberg*, no. 92; Jalapa, *C. L. Smith*, no. 1605.

23. *M. OBLONGIFOLIUM*, DC. Leaves oblong to oblong-lanceolate, acute to attenuate at the base, never lobed. — Prodr. v. 519 (1836). — Vera Cruz, near Orizaba, *Botteri*, no. 809, *Seaton*, no. 461, Cordova, *Bourgeau*, no. 1628, near Tantoyuca, *Berlandier*, no. 733; Oaxaca, at San Felipe, *Conzatti & González*, no. 560; Michoacan, *Pringle*, no. 4322; Morelos, *Pringle*, no. 7321; Costa Rica, *Pittier*, no. 6963.

b. Divisions of the outer involucre 5, obliquely acuminate.

24. *M. MICROCEPHALUM*, Less. Linnaea, ix. 268 (1834). — This species is known to me only from Lessing's characterization and from an excellent tracing, prepared from the type at Berlin by Mr. J. M. Green-

man. It is evidently close to *M. paludosum* in habit and foliage, differing chiefly, as Lessing himself notes, in its obliquely acuminate instead of rounded or obtuse involucre bracts.

c. Divisions of the outer involucre obovate, rounded or obtuse.

1. Decumbent perennial with elliptical discolorous leaves and pale yellow rays (often tinged with purple).

25. *M. MONTANUM*, Benth. Pl. Hartw. 64 (1840). *M. Liebmannii*, Sch. Bip. in Klatt, Leopoldina, xxiii. 89 (1887). — Oaxaca, *Graham*, *Pringle*, no. 4666; Chiapas, *Ghiesbreght*, nos. 174, 564; San Luis Potosi, *Pringle*, no. 3818; Cumbre de Estepa and Yavesia, *Liebmann*, no. 232.

2. Erect annuals.

26. *M. TENELLUM*, Hook. & Arn. Bot. Beech. 299 (1840). — Aca-pulco, *Sinclair*.

27. *M. CUPULATUM*, Gray, Proc. Am. Acad. viii. 291 (1870). — Sonora, *Palmer*, no. 20; Mazatlan, *W. G. Wright*, no. 1213; Alamos, *Palmer*, no. 726 (coll. of 1890). This species may possibly prove identical with the preceding. Both are distinguished from the following by their narrow lance-linear or oblong-linear leaves.

28. *M. PALUDOSUM*, HBK. Nov. Gen. & Spec. iv. 273 (1820). *M. divaricatum*, DC. Prodr. v. 520 (1836). *M. pumilum*, Benth. Pl. Hartw. 64 (1840), described from starved specimens. *M. copiosum* and *M. panamense*, Klatt in Engl. Jahrb. viii. 41, 42 (1887), founded upon trifling foliar variations without accompanying floral distinctions. *Dysodium divaricatum*, Rich. in Pers. Syn. ii. 489 (1807). *D. radiatum*, Desf. Cat. Hort. Paris, 1829, p. 182. *Alcina ovalifolia*, Lag. "Elench. Hort. Madr. 1805," Gen. et Spec. Nov. 32 (1816). *A. ovatifolia*, Jacq. f. Eclog. i. 115, t. 78 (1815?). *A. minor*, Cass. Dict. lix. 243. *Wedelia ovatifolia*, Willd. Suppl. 61 (1813). *W. minor*, Hornem. Hort. Hafn. 855 (1813). — A common weed throughout Mexico, Central America, and also occurring in the West Indies. Highly variable in leaf contour, length of ligules, etc., thus passing into many very diverse yet seemingly unstable forms.

* * Rays short, inconspicuous, exceeded by the involucre: peduncles short or none.

— Leaves ovate-lanceolate, rounded at the subsessile base: Panama to Brazil.

29. *M. CAMPHORATUM* [Benth. & Hook. f. Gen. ii. 349 (1873)], Baker in Mart. Fl. Bras. vi. pt. 3, 161 (1884). *M. digynum*, Benth. & Hook. f. l. c. acc. to Hook. f. & Jacks. Ind. Kew. ii. 188. *Unxia camphorata*, L. f. Suppl. 368 (1781). *U. digyna*, Steetz in Seem. Bot. Herald, 154, t. 30 (1852-1857). — Panama, *Seemann*, and Llanos de

Cumarál, Colombia, *André*, no. 1120, to British Guiana and tropical Brazil, where apparently common.

+ + Leaves narrowed to a petiole or an exauriculate base : stems solitary.

++ Leaves rhombic to elliptic-oblong, obscurely toothed, undivided.

30. *M. FLACCIDUM*, Benth. Vidensk. Meddel. 1852, 86. *M. tenellum*, var. *flaccidum*, Benth. Bot. Sulph. 115 (1844). — Nicaragua near Granada, *Oersted*; Costa Rica, San Francisco de Guadalupe, *Tonduz*, nos. 7187, 8498; Tepic, Mexico, *Hinds*, *Palmer*, no. 1814 (starved specimens).

++ ++ Leaves narrow, linear-oblong and unlobed or deeply cleft into narrowly oblong segments.

31. *M. HISPIDUM*, HBK. Nov. Gen. & Spec. iv. 273, t. 399 (1820). *M. coronopifolium*, Sch. Bip. in Hemsl. Biol. Cent.-Am. Bot. ii. 145 (1881), without character. — Arizona, Apache Pass, and near Ft. Huachuca, *Lemmon*, nos. 331, 2795, Santa Rita Mountains, *Pringle*; Sonora, *Wright*, no. 1205; Chihuahua, *Pringle*, no. 297; Durango, *Palmer*, no. 486 (coll. of 1896); San Luis Potosi, *Parry & Palmer*, no. 444½; Jalisco, *Palmer*, no. 260 (coll. of 1886), in part; Tacubaya, *Bilimek*, no. 593, *Schaffner*, no. 195. — Except in the nature of the pubescence this species closely simulates *M. sericeum*, Lag.

+ + + Leaves obovate, narrowed to an exauriculate base : stems several from the very base.

32. *M. arvense*. Prostrate spreading annual; root fibrous; stems several, 1 to 2 dm. long, more or less branched, purplish, covered all around with short weak white hairs : leaves obovate, entire or obsoletely crenate, rounded at the apex, 3-nerved above the acuminate and slightly connate base, bright green and glabrous or nearly so upon the upper surface, distinctly paler and hispidulous upon the nerves beneath, 1.2 to 2.5 cm. long, 1 to 1.6 cm. broad : heads very small, surrounded by small ovate to orbicular foliaceous bracts and borne close in the forks of the stem and also upon such short lateral cymes as to appear axillary; outer bracts of the involucre 2, ovate, distinct at the base, obtusely pointed : ray flowers 1 to 3, disk flowers about equally numerous : fruits semi-obovate, strongly compressed, reticulated upon the sides, more or less tuberculate dorsally. — Collected by C. G. Pringle in the Valley of Mexico, Federal District, 19 October, 1896, no. 7327 (type, in herb. Gray), and in fields near Toluca, 26 September, 1892, no. 5257, also at an earlier date by Schaffner in mountains near Santa Angela. Nearest *M. bibracteatum*, Wats., but differing markedly in the contour and cuneate base of the leaves as well as in its prostrate several-stemmed habit.

+ + + + Leaves rhombic to oblong, narrowed to a sessile auriculate base.

+ + Leaves oblong, relatively narrow.

= Outer involucre bracts 2, not accrescent, or scarcely so.

33. *M. BIBRACTEATUM*, Watson, Proc. Am. Acad. xxvi. 140 (1891).
Fields, Del Rio, State of Mexico, *Pringle*, no. 3230.

= = Outer bracts 4 to 5, obtuse, united at the base into a cup.

34. *M. GLABRUM*, Watson. Proc. Am. Acad. xxvi. 139 (1891).—
Guanajuato in valley near Irapuato, *Pringle*, no. 2821, and Jalisco near
La Barca, *Pringle*, no. 3863.

+ + + Leaves broad, mostly obovate or rhombic: outer involucre bracts 5, conspicuously accrescent.

= Outer bracts of the involucre lance-oblong, acute, distinct nearly or quite to the base.

35. *M. LONGIFOLIUM*, Cerv. acc. to Cav. Anal. Cien. Nat. vi. 303 (1803). *M. rhomboideum*, DC. Prodr. v. 520 (1836).—San Luis Potosi, *Parry & Palmer*, no. 444; Valley of Mexico, *Bourgeau*, no. 868, *Pringle*, no. 6455, *Harshberger*, no. 176.

= = Outer bracts of the involucre ovate, obtuse or obtusish, connate toward the base.

36. *M. PERFOLIATUM*, HBK. Nov. Gen. & Spec. iv. 274 (1820).—
A common and well-marked weed throughout Mexico, also established
in S. California at Los Angeles, *Parish Brothers*.

SYNONYMS AND DOUBTFUL OR EXCLUDED SPECIES.

M. achillaeoides, Hemsl. Biol. Cent.-Am. Bot. ii. 145 (1881) = *Villanova achillaeoides*, Less.

M. australe, Loeffl. It. Hisp. 268 (1758) = *Acanthospermum brasilum*, Schrank, acc. to Hook. f. & Jacks. Ind. Kew. ii. 188.

M. Baranguillae, Spreng. Syst. iii. 619 (1826) [*M. Baranquillae*, DC. Prodr. v. 521] = *Sclerocarpus africanus*, Jacq., acc. to DC. Prodr. v. 521.

M. Berterianum, Spreng. l. c. An unrecognized and poorly described West Indian plant, very likely not of this genus.

M. brachyglossum, J. D. Smith, Bot. Gaz. xiii. 74 (1888) = *Jaegeria hirta*, Less.

M. copiosum, Klatt in Engl. Jahrb. viii. 41 (1887) = *M. paludosum*, HBK.

M. coronopifolium, Sch. Bip. in Hemsl. l. c. = *M. hispidum*, HBK.

M. digynum, Benth. & Hook. f. Gen. ii. 349 (1873), acc. to Hook. f. & Jacks. l. c. = *M. camphoratum*, Benth. & Hook. f.

M. divaricatum, DC. l. c. = *M. paludosum*, HBK.

- M. Dombeyanum*, DC. l. c. 521, is a still doubtful species from Peru.
- M. Hildalgoa*, DC. l. c. = *Hildalgoa ternata*, Llav. & Lex.
- M. hirsutum*, Benth. & Hook. f. l. c. acc. to Hook. f. & Jacks. l. c. = *M. camphoratum*, Benth. & Hook. f.
- M. humile*, Sw. Prodr. Veg. Ind. Occ. 114 (1788) = *Acanthospermum humile*, DC.
- M. lanceolatum*, DC. Prodr. v. 519 (1836) = *M. diffusum*, var. *lanceolatum*.
- M. Liebmannii*, Sch. Bip. in Klatt, Leopoldina, xxiii. 89 (1887) = *M. montanum*, Benth.
- M. longifolium*, Brouss. ex Willd. Enum. Hort. Berol. 934 (1809) = (?) *M. longifolium*, Cerv.
- M. manillense*, Less. Linnaea, vi. 155, t. 2 (1831) = *M. diffusum*, Cass.
- M. ovatifolium*, Reichenb. Ic. Exot. t. 42 (1827) = *M. paludosum*, HBK.
- M. panamense*, Klatt, l. c. 42 = *M. paludosum*, HBK.
- M. pumilum*, Benth. Pl. Hartw. 64 (1840) = starved *M. paludosum*, HBK.
- M. ramosissimum*, DC. Prodr. v. 518 (1836) = *M. cinereum*, var. *ramosissimum*, Gray.
- M. rhomboideum*, DC. l. c. 520 (1836) = *M. longifolium*, Cerv.
- M. ruderale*, Sw. Fl. Ind. Occ. iii. 1372 (1806) = *Eleutheranthera ovata*, Poit., acc. to Hook. f. & Jacks. l. c.
- M. sericeum*, Benth. in Oerst. Vidensk. Meddel. 1852, p. 86, not Lag. = *M. linearilobum*, DC.
- M. sericeum*, var. *brevipes*, Gray, Proc. Am. Acad. xxii. 423 (1887) = typical *M. sericeum*, Lag.
- M. sericeum*, var. *longipes*, Gray, Proc. Am. Acad. xxii. 423 (1887) = *M. longipes*, Robinson.
- M. ternatum*, DC. acc. to Hook. f. & Jacks. Ind. Kew. ii. 188, = *Hildalgoa ternata*, Llav. & Lex.

It must be frankly confessed that among the species here kept up the following are to the writer still doubtful:—

M. americanum, L., which, although the type of the genus, cannot be matched by any specimen from near the original station.

M. microcephalum, Less. Not as yet satisfactorily represented in the herbaria examined.

M. paludicola, Taub., the description of which suggests a *Sclerocarpus*.

M. paniculatum, Gardn., which from description is not clearly separable from *M. oblongifolium*, DC.